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Landscape Change Shapes Bat Communities and Viral Dynamics in the Colombian Amazon

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Habitat degradation is a key driver of zoonotic disease emergence. In Colombia, deforestation along the Amazonian agricultural frontier is transforming ecosystems and potentially increasing pathogen spillover risk. Bats are important reservoirs of viruses with zoonotic potential, while also providing key ecosystem services. Within the Volkswagen Foundation-funded SIMPEL project, which investigates pathogen dynamics across land-use change gradients (objective 4), we sampled a subset of 431 bats across a deforestation gradient in Guaviare, Colombia, using ecological, molecular, and metagenomic approaches to evaluate the effects of environmental disturbance on diversity, viral prevalence, and virome composition. Preliminary results showed that habitat disturbance was associated with reduced bat richness, abundance, and occurrence probability. Hantavirus prevalence tended to be higher in recently deforested areas, whereas orthobunyavirus prevalence was highest in conserved forests, with no significant habitat-related difference. Metagenomic analyses revealed a diverse virome, including herpesviruses, papillomaviruses, adenoviruses, polyomaviruses, and coronaviruses, and ongoing analyses are evaluating virome patterns across gradients of habitat degradation. These findings suggest that land-use change influences both bat communities and viral circulation at the human-wildlife interface.

Keywords

zoonotic disease, land-use change, Amazon, bats, One Health, SIMPEL

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Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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